

REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, claim 6 is amended. No new matter has been added. Accordingly, after entry of this Amendment, claims 1, 4-6, 8, 12-17, 19-21 and 23-27 will remain pending in the patent application.

In the Office Action, claim 6 was objected to. In response, claim 6 is amended to change its dependency from claim 2 to claim 1. This amendment overcomes the objection. Accordingly, reconsideration and withdrawal of the objection to claim 6 are respectfully requested.

In the Office Action, claims 1, 12-14, 17 and 19 were rejected under 35 U.S.C. §102(e) as being anticipated by Bristol *et al.* (U.S. Patent Application Publication No. 2005/0074706) (hereinafter "Bristol"). The rejection is respectfully traversed.

Claim 1 recites a method of fabricating a device using a lithographic process, the method comprising, *inter alia*, "providing a second layer of conductive material on a lower surface of the resist layer, between the resist layer and the substrate; ... and applying an electric field across the resist layer by applying a potential difference between the two conducting layers, the direction of the field being substantially perpendicular to a plane of the resist layer during the exposing." The cited portions of Bristol do not disclose, teach or suggest these features.

Bristol teaches a semiconductor substrate (12) having a photoresist (10) that may be exposed to an electric field. *See* Bristol at [0013]; FIG. 1. A thin layer of conductive material (14) may be applied over the resist (10), as shown in FIG. 5. *See* Bristol *et al.* at [0025]. Bristol discloses applying an electric field between the conductive layer 14 and the substrate 12 during post exposure bake. *See* Bristol at [0027].

However, unlike claim 1, the cited portions of Bristol do not disclose, teach or suggest providing a second layer of conductive material on a lower surface of the resist layer, between the resist layer and the substrate and applying an electric field across the resist layer by applying a potential difference between the two conducting layers. According to claim 1, the second layer of conductive material is between the resist layer and the substrate and the difference of potential is applied between the two conducting layers. The cited portions of

Bristol do not disclose the use of a second conducting layer between the photoresist layer 10 and the substrate 12. Thus, Bristol cannot anticipate claim 1.

In response to Applicant's Response of June 14, 2007, the Examiner asserts that Bristol discloses a second layer of conductive layer on the lower surface of the resist. *See* Office Action at page 5, lines 12-14. The Examiner equates the substrate 12 with the second layer of conductive material recited in claim 1. These arguments lack merit.

As noted above, according to claim 1, the second layer of conductive material is between the resist layer and the substrate. If it is the Examiner's position that the second layer of conductive material of claim 1 corresponds to the substrate 12 of Bristol, then it is not clear what the Examiner considers to be the substrate of Bristol. As a matter of fact, the Examiner appears to equate the substrate of claim 1 with the substrate 12 of Bristol at page 2 of the Office Action by referring to FIG. 5 of Bristol. *See* page 2, line 23 of Bristol. The Examiner's reliance on the substrate 12 of Bristol as allegedly disclosing both the substrate and the second layer of conductive material of claim 1 is improper. In order to establish a *prima facie* rejection, "the identical invention **must** be shown **in as complete detail as is contained in the ... claim.**" (*See* MPEP § 2131, citing *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), emphasis added). MPEP § 2131 also indicates that "the elements **must be arranged as required by the claim.**" (*See* MPEP § 2131, citing *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990), emphasis added). The Office Action does not meet these requirements. Claim 1 recites various features (e.g. "a first layer of conductive layer", "a second layer of conductive", "a resist layer" and "a substrate") that are arranged in a specific manner. Nowhere do the cited portions of Bristol disclose, teach or suggest these features and arrangement. The Examiner is respectfully requested to show the invention of claim 1 in as much detail as recited in the claim or withdraw the rejection.

Claims 12-13 are patentable over the cited portions of Bristol at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 14 is patentable over the cited portions of Bristol for at least similar reasons as provided above for claim 1 and for the additional features recited therein. For example, the cited portions of Bristol do not disclose, teach or suggest a lithographic apparatus comprising, *inter alia*, "an electric field generator configured and arranged to apply a potential difference between a layer of conductive material on an upper surface of the resist layer and a layer of conductive material on a lower surface of the resist layer, between the resist layer and the

substrate, the direction of said field being substantially perpendicular to the plane of the resist layer.”

Claims 17 and 19 are patentable over the cited portions of Bristol at least by virtue of their dependency from claim 14 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 12-14, 17 and 19 under 35 U.S.C. §102(e) as being anticipated by Bristol are respectfully requested.

Claims 5 and 24-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bristol. The rejection is respectfully traversed.

Claim 5 is patentable over the cited portions of Bristol at least by virtue of its dependency from claim 1 and for the additional features recited therein. For example, the cited portions do not disclose or render obvious “providing a second layer of conductive material on a lower surface of the resist layer, between the resist layer and the substrate; ... and applying an electric field across the resist layer by applying a potential difference between the two conducting layers, the direction of the field being substantially perpendicular to a plane of the resist layer during the exposing,” as recited in claim 5.

Claim 24 recites a method of fabricating a device using a lithographic process, the method comprising, *inter alia*, “applying a layer of metallic conductive material to an upper surface of a resist layer on a substrate; ... applying an electric field across the resist layer, the direction of the field being substantially perpendicular to a plane of the resist layer during the exposing.”

As conceded by the Examiner, Bristol does not disclose the use of a metallic conductive layer on an upper surface of the resist layer. The Examiner nonetheless asserts that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a metallic conductive material since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.” The Examiner cites In Re Leshin, 125 USPQ 410.

MPEP § 2144.04 states: “[I]f the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court.”

It is respectfully submitted that the facts of In Re Leshin are not sufficiently similar to those in the instant application to permit the Examiner to rely on the rationale relied on by the court. The court determined in In Re Leshin that the application claims were not patentable because selecting a known plastic to make a container of a type made of plastics prior to the

invention was held to be obvious. In the present case, changing the material applied on the upper surface of the resist layer would have changed the method of fabricating the device, as recited in claim 1. For example, it would have changed the process for applying the material on the upper surface. The process disclosed in Bristol involves organic or polymer materials that are applied on the resist using spin coating techniques. Such techniques are inapplicable with a metallic material. As another example, it would have changed the step of exposing a part of the resist layer to ultraviolet radiation since organic or polymer materials have optical characteristics that are substantially different from those of metallic materials. Therefore, the facts of In Re Leshin are not sufficiently similar to the instant application for the Examiner to be able to rely on the court's rationale.

Furthermore, as noted above, the different materials disclosed by Bristol are merely organic or polymer materials that are preferably water soluble. *See* Bristol at [0026]. Thus, in the absence of impermissible hindsight based on Applicant's own specification, it would not have been obvious to apply a layer of metallic conductive material to an upper surface of a resist layer on a substrate, as recited in claim 24.

Claims 25 and 26 are patentable over Bristol at least by virtue of their dependency from claim 24 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 5 and 24-26 under 35 U.S.C. §103(a) as being unpatentable over Bristol are respectfully requested.

Claim 4 was rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Bristol in view of Park (U.S. Patent Application Publication No. 2003/0001493). The rejection is respectfully traversed.

Claim 4 is patentable over the cited portions of Bristol at least by virtue of its dependency from claim 1 and for the additional features recited therein.

The cited portions of Park fail to remedy the deficiencies of Bristol. The cited portions of Park merely disclose an electroluminescence device, having data lines formed from materials that are different from each other and corresponding to each function, and capable of enhancing its characteristics. *See* Park at [0003]. However, the cited portions of Park do not disclose, teach or suggest a method of fabricating a device using a lithographic process, the method comprising, *inter alia*, "providing a second layer of conductive material on a lower surface of the resist layer, between the resist layer and the substrate; ... and applying an electric field across the resist layer by applying a potential difference between the two conducting layers, the direction of the field being substantially perpendicular to a plane

of the resist layer during the exposing.” Therefore, any proper combination of the cited portions of Bristol and Park cannot result, in any way, in the invention of claim 4.

The Examiner asserts that “it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a metallic conductive layer to the invention of Bristol in order to form a signal wiring on the substrate, a gate data line as taught by Park.” Applicant sees no rhyme or reason for such a determination and the Examiner has not provided any objective evidence to support this determination. The cited portions of Bristol disclose the use of a conductive layer to apply a potential over the resist. The conductive layer of Bristol is intended to be a temporary structure. In support of this, Bristol makes clear that the conductive layer should be removed during the development stages. *See* Bristol at [0026] “the material is water soluble so it may be washed away during the development stages.” In any case, the conductive layer of Bristol is not used for making data lines or plugs of a device. This is in striking contrast to the conductive material of Park, which is a permanent structure that is used to make data lines. Thus, in the absence of impermissible hindsight based on Applicant’s own specification, there is no reason as to why one of ordinary skill in art would modify and combine Bristol and Park in the manner the Examiner has proposed.

Accordingly, reconsideration and withdrawal of the rejection of claim 4 under 35 U.S.C. §103(a) as being allegedly unpatentable over Bristol in view of Park are respectfully requested.

Claims 15, 16, 20, 21, and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bristol in view of Huisman *et al.* (U.S. Patent Application Publication No. 2006/0220126) (hereinafter “Huisman”). The rejection is respectfully traversed.

Claim 15 recites a method of fabricating a device using a lithographic process that includes *inter alia*, “applying a radiation sensitive resist on top of the device, the resist material incorporating a conductive material.”

As conceded by the Examiner, Bristol does not disclose, teach or suggest that the resist 10 is conductive or that a conductive material could be incorporated with the resist material. Indeed, Bristol teaches that the resist may comprise a blend of two polymers and/or a random copolymer containing both polar and non-polar components. *See* Bristol at [0014]. Bristol does not disclose, teach, or suggest that such polymers are conductive. The Examiner then relies on Huisman as allegedly disclosing, teaching or suggesting a photoresist including a conductive layer and asserts that it would have been obvious to substitute the conductive

photoresist layer of Huisman for the non-conductive layer of Bristol. Applicant strenuously disagrees.

First, Applicant contends that if one were to substitute the conductive photoresist layer of Huisman for the non-conductive layer of Bristol, one would significantly alter the mode of operation of the devices fabricated by Bristol. Specifically, if one were to substitute the conductive photoresist layer of Huisman for the non-conductive layer of Bristol, one would create shortcuts between the conductive layer 14 and the substrate 12 since in such a configuration the photoresist would not act as a dielectric layer, i.e. a current barrier. The flow of electrons between the conductive layer 14 and the substrate 12 will significantly damage the devices that are formed on the substrate 12.

Second, if one were to substitute the conductive photoresist layer of Huisman for a resist that comprises both polar and non-polar components as in Bristol, there would be no need to apply an electric field. In support of this, Bristol teaches that the electric field is used to orient or deblock polymers. *See* Bristol at [0021]. Thus, the Examiner's proposed modification would completely change the mode of operation of the device of Bristol and is, therefore, improper.

Third, the cited portions of Huisman **teach away** from using a conductive photoresist layer. In support of this, the cited portions of Huisman disclose that the conductors in the photoresist diffuse through the protective layer and dope the active layer. *See* Huisman at [0010]. The cited portions of Huisman further teach that such a doping results in an increased conductivity of the active layer, which requires a higher gate voltage to suppress the resultant conductivity. *Id.* The cited portions of Huisman further teach that "to ensure correct operation of the transistor it is extremely desirable here, that the protective layer is an electrically non-conductive material." *See* Huisman at [0011]. Thus, if anything at all, the cited portions of Huisman make clear that conductive elements in the photoresist layer have a negative impact on the devices being fabricated and, thus, **teach away** from the use of a photoresist incorporating a conductive material. In view of these teachings, one of ordinary skill in the art would clearly not modify Bristol to include a photoresist layer including a conductive material.

As such, for at least this reason, one would not modify and combine Bristol and Huisman in the manner the Examiner has proposed.

Claim 16 recites a method of processing a device using a lithographic process that includes "exposing the conductive resist material to UV radiation while applying an electric

field across the resist material by directly coupling the conductive resist material to a fixed potential.” As discussed above, the cited portions of Bristol fail to disclose, teach, or suggest that the resist material incorporates a conductive material and Huisman teaches away from these features. Accordingly, claim 16 is not obvious over the combination of Bristol and Huisman.

Claims 20 and 21 are patentable over the cited portions of Bristol, Huisman and any proper combination thereof at least by virtue of their dependency from claim 15 and for the additional features recited therein.

Claim 23 is patentable over the cited portions of Bristol, Huisman and any proper combination thereof at least by virtue of its dependency from claim 16 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 15, 16, 20, 21, and 23 under 35 U.S.C. §103(a) as being unpatentable over Bristol in view of Huisman are respectfully requested.

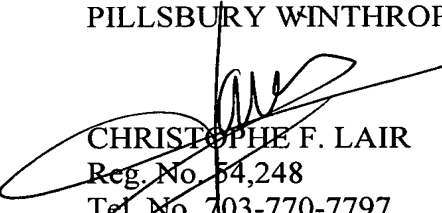
In the Office Action, claims 6, 8 and 27 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, claims 6 and 8 are patentable for at least the same reasons as provided above for claim 1. Similarly, claim 27 is patentable for at least the same reasons as provided above for claim 24.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance. If questions relating to patentability remain, the Examiner is invited to contact the undersigned to discuss them.

Should any fees be due, please charge them to our deposit account no. 03-3975, under our order no. 081468/0309171. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced deposit account.

Respectfully submitted,

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